Research in University Colleges

Belgium

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Seminar on R&D in NIFU STEP Oslo

1. Belgium since 1989 and UC

- Federal country: 3 communities/3 regions
- Scientific research is responsibility of Communities and Regions
- Separated development
- New laws
  - French-speaking: 1996 merger of institutions
  - Dutch-speaking: 1994 merger of institutions

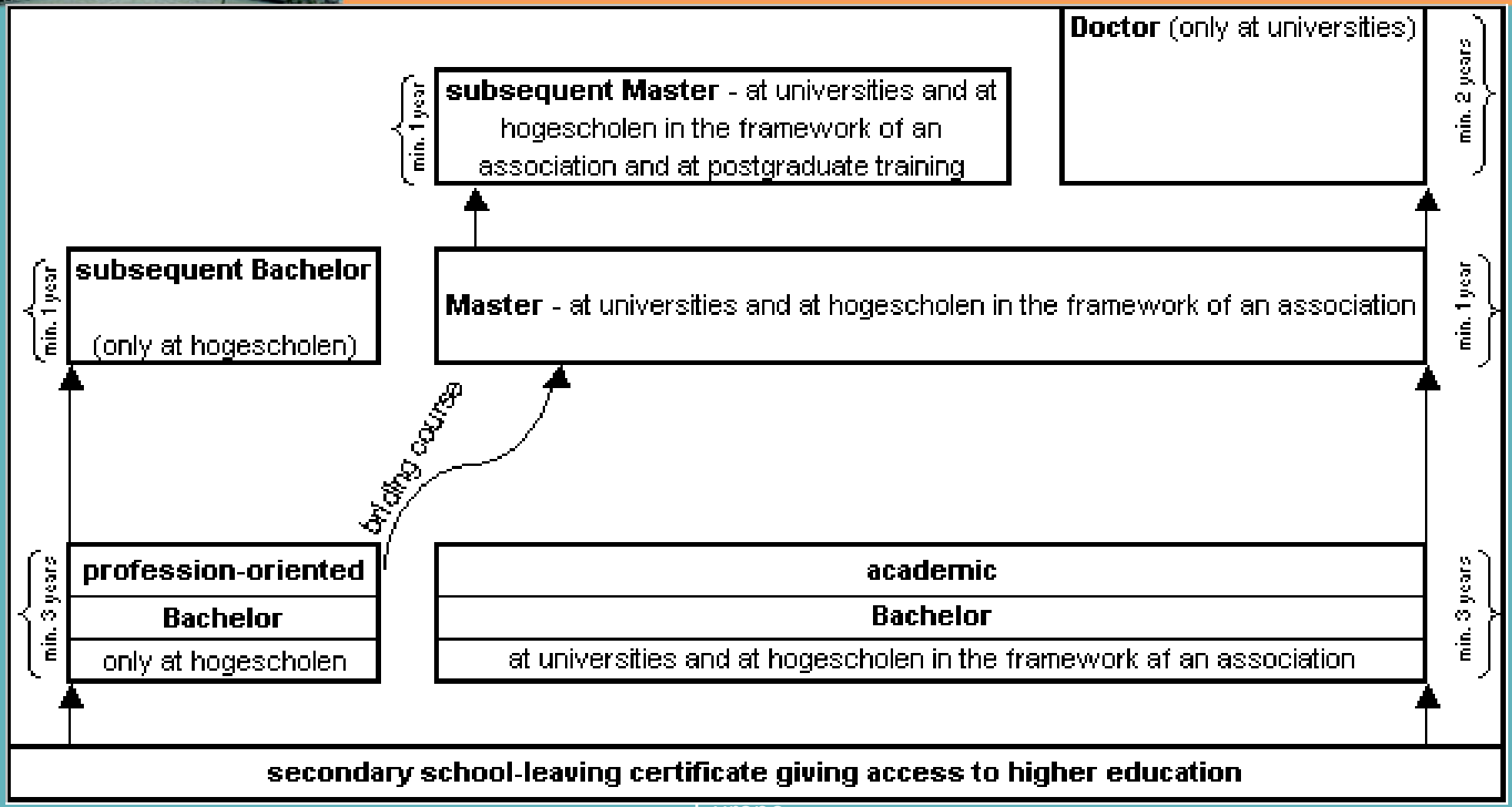
Number of UC and U

- French-speaking community: U = 9
  - UC
    - 29 Hautes Écoles
    - 17 Écoles Supérieures des Arts
    - 4 Instituts Supérieurs d'Architecture
- Dutch-speaking Community: U = 6
  - 22 University Colleges

Number of enrolments

- 2005-2006
  - University colleges: 188,883
  - Universities: 141,841
  - If two-cycle education is merged with U: 43,542 students have to be taken out
  - The ratio UC / U students wiil be 145,341 / 185,383

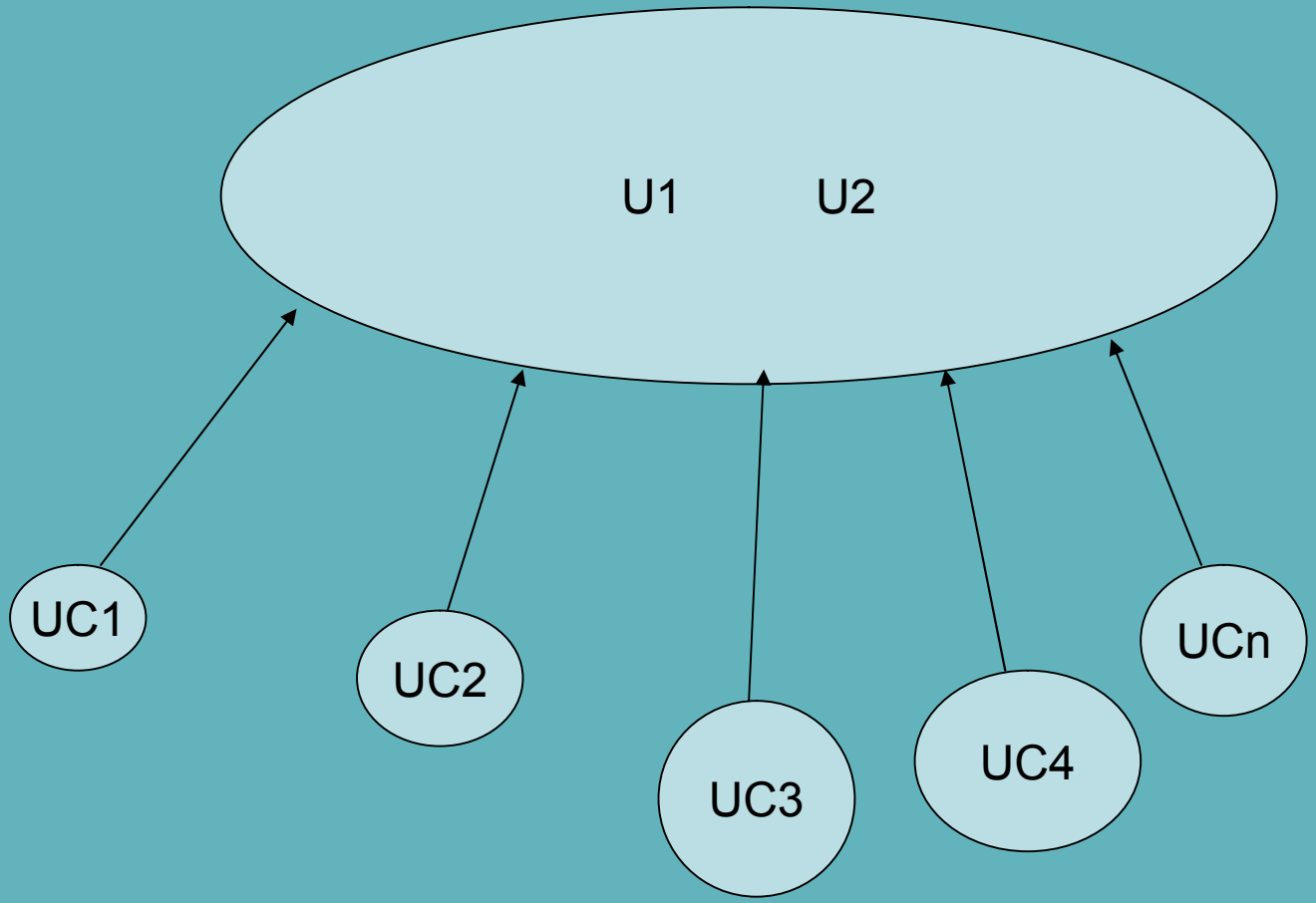
Higher Education structure



Collaborative structure Universities and University Colleges

- French-speaking Community
  - 3 “académies universitaires” composed of at least 2 universities, with possible “partenariat” with some university colleges
  - “Pôle” composed of universities and university colleges
- Dutch-speaking Community
  - 5 “Associations” composed of a university with at least 1 university college (important target: academisation of master programmes in UC before 2013)

Académie



Pôle

U1

U2

UC1

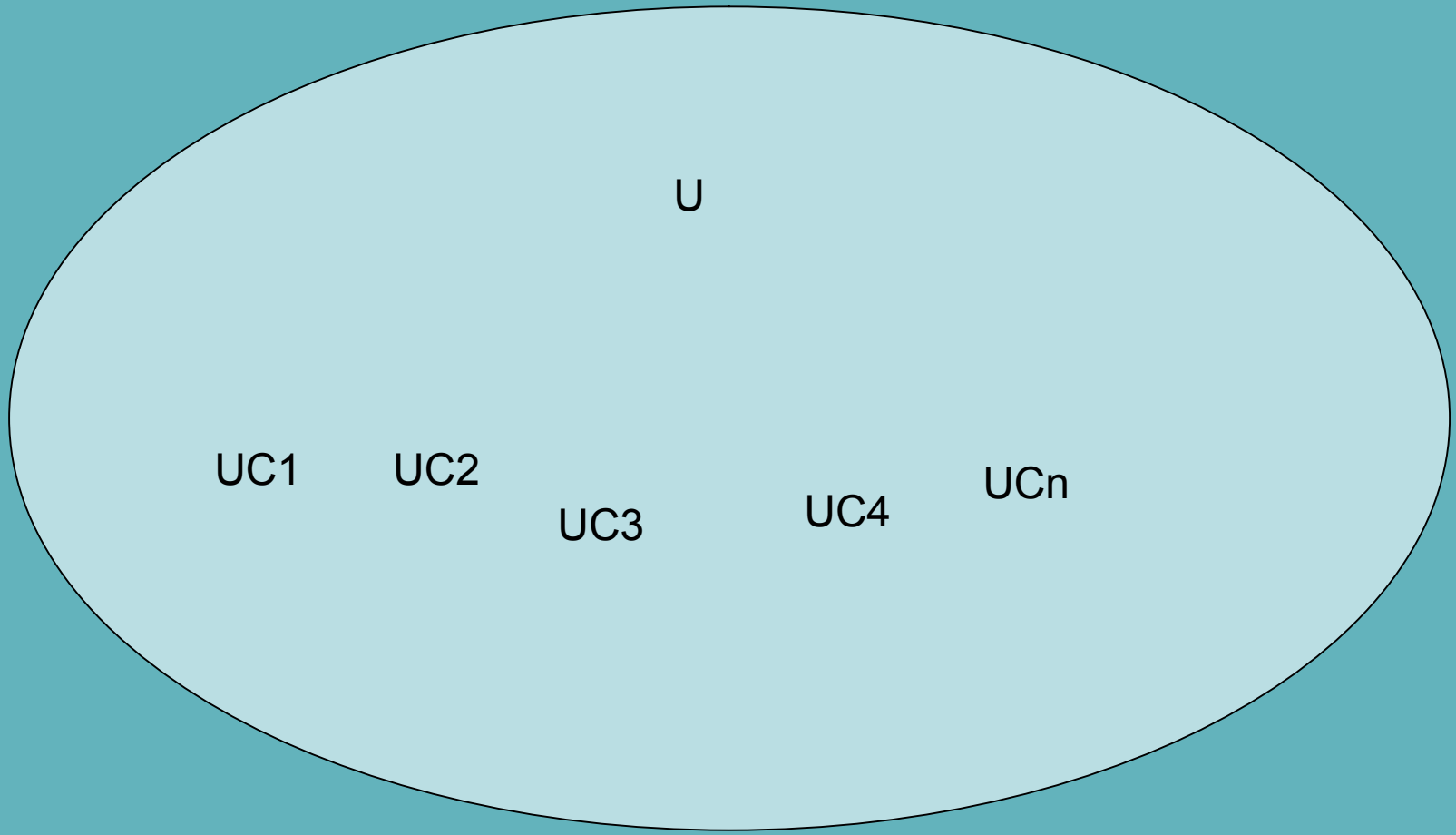
UC2

UC3

UC4

UCn

Association



Domains of study

- Architecture
- Health care
- Industrial sciences and technology; nautical sciences
- Audio-visual and expressive art
- Music and drama
- Biotechnology
- Education
- Development of products
- Social “agogie” (promotion of social welfare)
- Applied linguistics
- Commercial sciences and business administration

2. National objectives for R&D for UC

- Limited federal policy (26.56% of 2006-budget for R&D)
- Policy determined by Communities and Regions
- Target: 3% of GDP for R&D agreed in Barcelona (2002) to be invested in 2010
- Flanders: -applied research

  -academisation of masters
- French-speaking Community: applied research

2. National objectives for R&D for UC

- Regional development:
  - First objective
  - Linked with immediate surroundings of UC
- Improve teaching and education
  - Academisation of masters (Flanders)
  - Académies and Pôles (French-speaking Community)
- Improve professional practice
  - Academisation (Flanders)
  - See Paquay (French-speaking Community)

3. Priority setting

- The main purpose is the education of professionals – Teaching is main objective
- Academisation process of masters in Flemish UC stresses research as basis of teaching; research (project oriented) should be a substantial part of this academisation process (special funding provided for academisation)

4. Extent of research

Table 1 . Gross expenditures for R&D (GERD) in Belgium (2000-2005) (in million EUR in current prices)

Source of expenditure	Year					
	2000	2001	2002	2003	2004	2005
	%	%	%	%	%	%
Business expenditures on R&D (BERD)	72.3	73.0	70.4	69.7	69.4	68.3
Government expenditure on R&D (GOVERD)	6.3	6.2	7.2	6.9	7.2	7.7
Higher Education expenditure on R&D (HERD)	20.2	19.7	21.2	22.2	22.1	22.8
Not for Profit Organisations expenditures on R&D (PNP)	1.2	1.1	1.2	1.2	1.3	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
GERD in million €	4,963.947	5,373.378	5,200.737	5,177.444	5,349.613	5, 427.716

Source: Commissie Federale Samenwerking, Overleggroep CFS/STAT

4. Extent of research

- In 2005 Belgium spent 1.86% of the GDP on R&D
- Universities (HERD) spent 0.40% of the GDP
- University colleges (HERD) spent 0.01% of the GDP

Source: CFS-STAT data: berekening Federaal Wetenschapsbeleid

4. Extent of research (staff)

Table 2 . R&D personnel in university colleges and universities in Belgium (2000-2005) distinguished between researchers, technical personnel and other personnel (FTE)

Year	University colleges				Universities			
	Total	Function	N	% of year total	Total	Function	N	% of year total
2000	416.1	Researcher	301.9	72.6	15,215.5	Researcher	11,319.7	74.4
		Technician	41.3	9.9		Technician	2,711.4	17.8
		Other	72.8	17.5		Other	1,184.4	7.8
2001	488.8	Researcher	358.5	73.3	15,502.8	Researcher	11,525.0	74.3
		Technician	49.9	10.2		Technician	2,718.3	17.5
		Other	80.4	16.5		Other	1,259.8	8.1
2002	602.3	Researcher	494.6	82.1	15,239.7	Researcher	11,390.5	74.7
		Technician	50.4	8.4		Technician	2,581.8	16.9
		Other	57.4	9.5		Other	1,267.5	8.4
2003	624.0	Researcher	514.7	82.5	15,630.1	Researcher	11,690.8	74.8
		Technician	50.8	8.1		Technician	2,600.2	16.6
		Other	58.6	9.4		Other	1,339.1	8.6
2004	617.9	Researcher	573.3	92.8	16,544.4	Researcher	12,752.3	77.1
		Technician	28.0	4.5		Technician	2,570.8	15.5
		Other	16.7	2.7		Other	1,221.3	7.4
2005	702.3	Researcher	654.2	93.2	16,759.6	Researcher	12,958.9	77.3
		Technician	29.1	4.1		Technician	2,534.4	15.1
		Other	19.0	2.7		Other	1,266.2	7.6

Source: Commissie Federale Samenwerking, Overleggroep CFS/STAT

4. Extent of research (UC)

Tabel 3 .Higher Education expenditure on R&D (HERD) in university colleges in Belgium (2000-2005) differentiated according to the domain of research (in EUR in current prices)

Science domain	Year											
	2000		2001		2002		2003		2004		2005	
	HERD	%	HERD	%	HERD	%	HERD	%	HERD	%	HERD	%
Natural sciences	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Engineering	12,349,579	53.8	13,703,719	54.1	15,372,184	48.7	16,063,619	47.6	16,452,815	50.5	17,445,098	48.1
Medical sciences	988,168	4.3	970,299	3.8	2,259,051	7.2	2,443,001	7.2	2,471,369	7.6	2,758,407	7.6
Agricultural sciences	3,861,065	16.8	4,444,143	17.5	3,867,979	12.2	4,010,192	11.9	2,616,479	8.0	2,872,267	7.9
Social sciences	3,814,253	16.6	3,898,123	15.4	6,102,469	19.3	6,755,908	20.0	6,400,8 00	19.7	7,379,648	20.4
Humanities	1,960,192	8.5	2,311,010	9.1	3,990,554	12.6	4,454,771	13.2	4,612,110	14.2	5,776,533	15.9
Total	22,973,256	100.0	25,32 7,294	100.0	31,592,236	100.0	33,727,493	100.0	32,553,573	100.0	36,231,954	100.0

Source: Commissie Federale Samenwerking, Overleggroep CFS/STAT

4. Extent of research (U)

Tabel 4. Higher Education expenditure on R&D (HERD) in universities in Belgium (2000-2005) differentiated according to the domain of research (in EUR in current prices)

Domain of research	Year											
	2000		2001		2002		2003		2004		2005	
	HERD	%	HERD	%	HERD	%	HERD	%	HERD	%	HERD	%
Natural sciences	240,398,443	25.0	250,329,401	24.7	238,606,791	22.9	248,367,770	22.8	247,601,515	22.2	259,620,881	22.1
Engineering	156,577,181	16.3	161,945,653	16.0	164,381,728	15.8	174,379,067	16.0	180,640,982	16.2	188,057,775	16.0
Medical sciences	239,963,517	24.9	248,729,604	24.5	252,356,551	24.2	266,336,195	24.5	292,148,745	26.2	315,018,111	26.8
Agricultural sciences	100,614,732	10.5	110,435,003	10.9	120,380,734	11.5	121,978,453	11.2	116,426,708	10.4	125,531,432	10.7
Social sciences	151,284,321	15.7	164,312,947	16.2	184,241,950	17.7	190,883,657	17.6	194,708,421	17.4	196,944,679	16.8
Humanities	72,880,301	7.6	77,892,558	7.7	82,752,697	7.9	85,665,721	7.9	85,127,666	7.6	88,975,429	7.6
Total	961,718,494	100.0	1,013,645,166	100.0	1,042,720,452	100.0	1,087,610,863	100.0	1,116,654,038	100.0	1,174,148,307	100.0

Source: Commissie Federale Samenwerking, Overleggroep CFS/STAT

4. Extent of research

Table 5. R&D expenditures in 2004 and 2005 by university colleges in the Flemish and the French Community of Belgium (in €)

Communities	2004		2005	
	€	%	€	%
Flemish Community	29,308,284	90.03	32,896,249	90.79
French Community	3,245,289	9.97	3,335,705	9.21
Total	32.553.573	100.00	36.231.954	100.00

4. Extent of research

- In 2000
  - UC spent 2.38% of U research money for research
  - UC employ 2.74% of the number of researchers in U
- In 2005
  - UC spent 3.09% of U research money for research
  - UC employ 4.19% of the number of researchers in U

4. Extent of research

- The academisation policy in Flanders contributed to a remarkable increase of the R&D expenditures by UCs in Flanders
  - 2005: € 32.9 MIO

  Information added on 16 September 2009:
  - Attention for the discrepancy in the figures collected by the author and by 'Federaal Wetenschapbeleid' in 2009:
    - Data provided by associations or UCs to the author
      - 2006: € 47.3 MIO (or 44% more than in 2005)
      - 2007: € 62 MIO (or 88% more than in 2005)
    - Data provided by 'Federaal Wetenschapsbeleid'
      - 2006: €45.5 Mio
      - 2007: €57.7 Mio

4. Extent of research

- Publications mentioned in SCIE and SSCI
  - 1992 UC 1.3% / U 99.4% (N = 5,757)
  - 2005 UC 1.6% / U 98.9% (N = 11,897)
  - Total (1992-2005) UC 1.2 (0.88%) / U 99.1% (N = 118,416)
- Other Publications
  - Other reports refer to publications, but small number in comparison with U
- Patents: 2 (pm)
- Spin-offs: 4 (pm)

4. Scope of research

- UC: priority to applied research
- U: priority to fundamental (and applied) research
- UC: almost 50% of expenditure for engineering, followed by social sciences, and humanities (no natural sciences)(see table 3)
- U: medical and natural sciences are leading, followed by social sciences and engineering (see table 4)

5. Funding of research

- 3% of GDP for R&D agreed in Barcelona (2002) to be invested in 2010
- Regions and Communities are responsible for scientific research
- Diminution of cost of salaries of researchers
- Increase of funding
- Promotion of research

5. Funding of research (a)

- Research councils

  Funding research councils

  -until some years ago: UC members could not apply for funding at the FWO/FNRS

  -last years UC members can apply, but only in collaboration with a university

  -small number of applications

  Advisory research councils

  -UC can deliver members

5. Funding of research (b)

- National funding agencies
  - Funding is provided by **Communities** and **Regions**
  - Each Community and Region has several programmes specially established for funding of research in UC, and programmes in collaboration with universities, industry, or other private research units

5. Funding of research (c)

- EU
  - The number of UC research units applying for EU funding is very small

5. Funding of research (d)

- Trade and Industry
  - Contract research, mostly with SME's
  - Most of the special programmes for UC suppose a collaboration with the industry

    e.g. - TETRA in Dutch-speaking Belgium

    - FIRST Hautes Écoles in French-speaking Belgium

6. Cooperation with universities and industry

- In both communities cooperation with U (Academisation and Académies) and industry is stressed (often condition for funding)
- Cooperation with industry (mainly SME)
  - Between 1997 and 2006 2700 organisations participated in projects of UC, 50% of these organisations were SME or social profit organisations (FL)
  - FIRST Hautes Écoles (FR)

7. Qualifications of staff for doing research

- See Frascati principles
- In principle: most researchers start as master (ISCED 5); in academisation process the teachers need a PhD (ISCED 6)

8. Problems and challenges

- Late start of academisation
  - 2001: curriculum in line with U curriculum: score 2.54 on 5
  - 2001: collaboration UC/U for teaching: score 2.71 on 5
  - 2001: collaboration UC/U for research: score 2.54 on 5
- Funding
  - Very small in comparison with universities

    e.g. cost per student (2005)

    FIC: UC € 6,322.92 / U € 14,326.61

    FrC: UC € 4,741 / U € 7,835

8. Problems and challenges

- Lack of research culture
  - Number of staff members involved in research is very small (1999: 9% of 4.043 teachers) ;
  - small number of teachers is publishing (1999: 0.86% of teachers working on publication)
  - Working for PhD (1999): 1.18% of sample
  - Research culture will develop differently in BA education than in MA education

8. Problems and challenges

- In March 2007:
  - 12% of UC middle managers did not answer a question about the efficiency of research organisation
  - 19% of UC middle managers did not answer a question about QA of research
  - 27% of UC middle managers did not answer the question: I expect each researcher to be accountable for his or her research

8. Problems and challenges

- Selection of staff/lack of staff with PhD
  - Teachers were hired for teaching, not for research

    Estimation % PhD in UC in Flanders: 14.61% (2007) (14.25% in 2004)
- Teaching load
  - Average teaching hours per week: 14h/week

    Holders of PhD have same teaching load
  - Average working hours per week: 46 hours (SD = 11.07)

8. Problems and challenges

- Adaptation of U and UC culture and vice versa
- Age structure of the staff (57.48% older than 45 y)
- Expectations of students (1999: prefer a practice orientated education)
- Will MA education of UC be merged with U?